

## LACE TRAPPING DEVICE

### Description

#### Background of the Invention

#### Field of the Invention

5 This invention relates, in general, to shoe lace retainers, and, in particular, to a lace trapping device for securing the tied ends of the lacing which device can be attached to any type of footwear having laces.

#### Description of the Prior Art

Conventional footwear is provided with laces or other fasteners to act as closure means. Professional athletes, joggers, young children and, in fact, all who wear shoes fastened with laces are often faced with the annoyance of bow-knots which become untied at inconvenient or hazardous times which might cause tripping over the loose laces or catching them on something.

15 Ordinary laces readily loosen and become undone because they are formed of relatively smooth woven yarn materials. Only the inherent friction of the lace surface and the snugness of the knot formed by the wearer determine the period of time that a knot will remain tied.

Prior art devices attempting to address this problem are generally elaborate, difficult to work with or ineffective.

20 U.S. Patent #D453,413, issued 2/12/2002 to Tsujino, describes an ornamental design for a shoelace cover.

U.S. Patent #4,571,854, issued 2/25/1986 to Edens, concerns a knot latch device for footwear that has a structure readily adapted to receive a shoelace. The shoelace is

then bowed about a portion of the knot latch device, and the knot latch device then folded about the bowed lace. The knot latch device includes a plurality of mating hook and loop elements to fasten the device securely about the bowed lace. Structure is included to mask at least a portion of the knot latch device when the device is secured about a bowed  
5 lace of the footwear.

U.S. Patent #4,999,888, issued 3/19/1991 to Miller, is for a shoelace retainer that includes a flexible, elongated strap member having a plurality of hook fastener elements on one surface thereof and a plurality of complementary loop fastener elements on an opposite surface thereof. A tab member having an elongated slot is disposed at a first end  
10 of the strap member for attaching the strap member to the footwear. The free ends of the shoelace are passed through the slot and the ends are tied in a conventional bow knot. The bow loops and free ends of the shoelace are placed on top of the strap member and the strap member is rolled up and onto itself, whereby the hook fastener elements become  
15 interlocked with the loop fastener elements, thereby confining the bow loops and free ends between convoluted layers.

U.S. Patent #5,170,573, issued 12/15/1992 to Clinch, provides a miniature pouch device which is removably attachable to the instep of a shoe for captivating the lace and bow used to tie the shoe, and retain them in a neat small package which sits in the location where the bow would normally reside on a conventional pair of shoes.

20 U.S. Patent #5,924,177, issued 7/20/1999 to Jongejan, shows a shoelace retention device for removably securing the loops and tails of a bow tie knot of a shoelace in a close relationship to the shoe. The inventive device includes the shoe lace retention

device comprising an elongate base member for mounting the shoe lace retention device on a shoe, a central riser mounted on the base member, and an elongate securing member mounted to the central riser for holding the loops and tails of a bow tie knot of a shoe lace in a position adjacent to the shoe.

5        U.S. Patent #5,671,517, issued 9/30/1997 to Gourley, claims a shoelace safety guard that covers and retains the shoe laces to prevent inadvertent snagging or other interference with the laces when wearing shoes. An inner fastener element is attached by a tab to the shoe lace at the furthest lace away from the point at which the laces are tied. The shoelaces are then tied by a bow over the inner fastener element. An outer fastener  
10      element attached at a fold is then folded over onto the inner fastener element and retained by a hook and loop material to cover and retain the laces. The outer fastener element may have hook and loop material to allow attachment of emblems, reflectors and other objects.

U.S. Patent #4,879,787, issued 11/14/1989 to Walls, describes a shoelace knot  
15      securing device that comprises a body, a pair of straps each having two ends wherein one end of each strap is permanently attached to one end of the said body and the other end of each strap is free and wherein the said straps extend outward from the said end of the said body, and an anchor loop provide at the other end of the said body. The said body is provided with a fastener adapted to coact with a fastener on each of the said straps to  
20      detachably couple the free end of each of the said straps to the said body, and wherein each of the said straps is provided with a fastener adapted to coact with a fastener on the said body to detachably couple the said free ends of the said straps to the said body.

U.S. Patent #4,766,682, issued 8/30/1988 to Malloy, indicates a removable lace cover strap adapted for use about the instep of a shoe having a knotted lace to prevent the untying thereof. The lace cover has an elongated strap with an elastic medial portion and opposite end portions with hook and loop fastener patches for attaching the opposite end portions to each other.

U.S. Patent #5,353,483, issued 10/11/1994 to Louviere, puts forth a method and apparatus for lacing and securing a shoe onto the foot using an elongated lace and the five spaced apart holes in the shoe's collar on each side of the shoe's tongue. A two part fastening clip includes a flat rectangular clip base having spaced apart eyelets and an elongated slot and a clip lever designed to mate in hinged relation with the clip base by insertion of an enlarged cylindrical edge portion of the clip lever into the elongated slot of the clip base and also having spaced apart eyelets. The shoe lace passes through the shoe's holes on opposite sides of the tongue, through the eyelets in the clip base, through the eyelets in the base, through the eyelets in the clip lever, and finally through the adjacent hole in the shoe collar. Then the two ends of the lace are securely tied together leaving sufficient slack to permit the foot to be inserted into the shoe. The clip base and the clip lever are hingedly joined together by inserting the clip lever's enlarged cylindrical edge into the slot in the clip base and the clip lever is secured flat against the clip base by locking means, thereby securing the laced shoe onto the foot.

U.S. Patent #4,780,936, issued 11/1/1988 to Brecher, illustrates footwear such as shoes, sneakers and the like with a pair of flexible band members, one end of each flexible band member being secured to a tongue of the footwear in the vicinity of a knot

tying together ends of laces for the footwear; the other, free ends of the band member being movable between an unfastened position and a releasably fastened position about a bow-knot formed in the tied together shoe laces to impede the loosening of the bow-knot.

U.S. Patent #5,778,500, issued 7/14/1998 to Illingworth, shows a knot securing

5 device of particular benefit in securing shoelace knots. The securing device is made from a flexible material with a region having hook elements, a region having loop elements and a pair of apertures in the flexible material for allowing the open ends of a shoelace to pass through from one surface of the material to the opposite surface of the material, wherein the shoelace is then tied in a knot and the regions with the hook and loop

10 elements are brought into contact to form a secure, but releasable, lock around the knot.

U.S. Patent #5,042,119, issued 8/27/1991 to Williams, describes devices and methods for containing tied lace ends on footwear. Each tied lace ends containment device comprises members which affix the device to a shoe, enclose otherwise loose tied lace ends including the bow to eliminate or greatly alleviate the danger, annoyance of

15 freely dangling lace ends, and firmly securely engage the tie lace containment. A pocket is disclosed provided for conveniently carrying valuables or other small items on the footwear during an activity. Opportunity for placement of fashionable designs or personal identification or the like is provided.

What is needed is a simple lace guard which is inexpensive to manufacture and

20 easy to apply and use or one that is already built into the footwear and that is easy to use.

**Summary of the Invention**

A primary object of the present invention is to offer a simple, inexpensive means for locking bow-knots in place.

Another object of the present invention is to provide a lacing retainer to prevent  
5 the lacings from loosening after tying and to prevent tripping or catching the lacings.

One more object of the present invention is to provide a short strap device with a single slot for lacing the bottoms of the lacing through the slot to attach the device to the footwear and a cross-over hook and loop closure at the bottom of the lacings that is easy and inexpensive to manufacture.

10 An additional object of the present invention is to provide a lacing retainer strap with a single slit that is easy to apply to footwear by threading the lacings through the slit.

A further object of the present invention is to provide a built-in Mating hook and loop fastener closing strap at the bottom of the lacings on the footwear that is readily available and easy to use.

15 An added object of the present invention a lacing guard strap positioned at the bottom of the lacings so that it does not interfere with the lacing operation.

In brief, a lace trapping device comprises a strip of material having a closure means is either attachable the lacings of a piece of footwear or built into the footwear at a point well below the top of the laces where they are tied so that the device does not  
20 interfere with tying the laces and yet is capable of closing over the lace ends after the laces are tied.

The lace trapping device of the preferred after market embodiment of the present invention is a piece of material with a slit in the middle for the each end of the shoelace to pass through as the shoe is being laced up (typically in the forward 1/3 of lace area) to attach the device to the shoe and hook fasteners to one side of the slit and loop fasteners 5 on the other side of the slit and opposite face of the material as the hooks so that when the two ends overlap with the device in a closed loop configuration the hook and loop fasteners adhere to one another. The lacing process then continues as normal. After the device is attached to the shoe, the user would tie the laces in a bow, open the device so that it is lying flat on top of the shoe, then lay the tied ends of the lacing on the open 10 device. The user would then grab each end of the lace trapping device and form a loop that traps them and is secured by the hook and loop fasteners.

One OEM built-in embodiment of the present invention would involve a strip of material about 2 inches long attached by the end on one side of the shoe near the lace area with hook fasteners on it about 1 inches long on what would be the bottom when the strip 15 is pushed down on over the top of the laces. There would be a patch of loop fasteners attached on the top of the shoe on the opposite side of the laces. After the user ties a bow, the loops and ends would then be held together and brought toward the toe of the shoe so that the strip, when pushed down to allow the hook fasteners to engage with the loop fastener patch on the other side would again "trap" the laces.

20 Alternate embodiments of the present invention include a pair of flexible strips with enlarged ends which are normally spaced apart but cross over each other and overlap with a tension fit to retain the laces underneath the overlapping strips, two flexible pieces

normally spaced apart with holding tabs and mating interlocking teeth on each piece that mutually engage when overlapped to retain the laces underneath the interlocking strips, and a flexible piece of material having two plates normally spaced apart connected by a living hinge with mating click lock components on each piece so that the two plates may

5 be interlocked with the laces inbetween thereby retaining the laces.

An advantage of the present invention is that it provides a simple, inexpensive means for locking bow-knots in place.

Another advantage of the present invention is that it prevents the lacings from loosening after tying and to prevent tripping or catching the lacings.

10 One more advantage of the present invention is that it is easy and inexpensive to manufacture.

An additional advantage of the present invention is that it is easy to apply to existing footwear.

15 A further advantage of the present invention is that it may be built into the footwear.

An added advantage of the present invention is that it does not interfere with the lacing operation.

#### **Brief Description of the Drawings**

These and other details of my invention will be described in connection with the

20 accompanying drawings, which are furnished only by way of illustration and not in limitation of the invention, and in which drawings:

FIG. 1 is a perspective view of the preferred embodiment of the lace trapping invention applied to a shoe;

FIG. 2 is a perspective view of the preferred embodiment of the lace trapping invention of FIG. 1 applied to a shoe in an inverted position from that of FIG. 1;

5 FIG. 3 is a perspective view of the preferred embodiment of the lace trapping invention of FIG. 1 applied to a shoe with the lace trapping invention closed over the tied lacings;

FIG. 4 is a perspective view of the preferred embodiment of the lace trapping invention of FIG. 1 showing the various parts of the invention;

10 FIG. 5 is a top plan view of the preferred embodiment of the lace trapping invention of FIG. 1 showing the various parts of the invention;

FIG. 6 is a side elevational view of the preferred embodiment of the lace trapping invention of FIG. 1 showing the various parts of the invention;

15 FIG. 7 is a bottom plan view of the preferred embodiment of the lace trapping invention of FIG. 1 showing the various parts of the invention;

FIG. 8 is a perspective view of an alternate embodiment of the lace trapping invention built into a shoe with two parts to the strap;

FIG. 9 is a perspective view of the alternate embodiment of the lace trapping invention of FIG. 8 with the strap closed over the tied lacings;

20 FIG. 10 is a perspective view of another alternate embodiment of the lace trapping invention built into a shoe with a single strap, attached to one side of the lacings, that passes through a loop on the other side of the lacings and folds back to fasten to itself;

FIG. 11 is a perspective view of the alternate embodiment of the lace trapping invention of FIG. 10 with the strap closed over the tied lacings;

FIG. 12 is a perspective view of another alternate embodiment of the lace trapping invention having two tension arms which interlock over each other to trap the tied lacings;

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FIG. 13 is a perspective view of the alternate embodiment of the lace trapping invention of FIG. 12 with the two tension arms interlocked over each other trapping the tied lacings;

FIG. 14 is a perspective view of another alternate embodiment of the lace trapping invention having a tension ring with teeth which interlocks with mating teeth on another small ring segment to trap the tied lacings;

FIG. 15 is a perspective view of the alternate embodiment of the lace trapping invention of FIG. 14 with the tension ring teeth interlocking with mating teeth on another small ring segment trapping the tied lacings;

15 FIG. 16 is a perspective view of another alternate embodiment of the lace trapping invention having two hinged flexible tabs which interlock with a pronged snap element in one tab snap fitting into an opening in the other tab to trap the tied lacings between the tabs;

FIG. 17 is a perspective view of the alternate embodiment of the lace trapping invention of FIG. 16 with the two hinged flexible tabs interlocked with a pronged snap element in one tab snap fit into an opening in the other tab trapping the tied lacings between the tabs.

**Best Mode for Carrying Out the Invention**

In FIGS. 1-17 a lace trapping device 20 and 20A-20K for retaining the tied ends 31 of lacing on footwear 40 comprises a lace trapping element 25, 25A-25F, and 16A-16D capable of being attached to a piece of footwear 40 adjacent to a lower threaded portion of the lacing 30 on the piece of footwear spaced from the tied ends 31 of the lacing a sufficient distance to permit unimpeded tying of the ends of the lacing. The lace trapping element is capable of opening, as in FIGS. 1 and 2 to receive the tied ends 31 of the lacing and capable of closing over the tied ends 31 of the lacing and trapping the tied ends of the lacing as in FIG. 3.

10           A securing means 21 and 22, 17, 14A and 14B, and 11 and 13 on the lace trapping element removably engages at least one end of the lace trapping element with at least one other end of the lace trapping element to bind the lace trapping element over the tied ends 31 of the lacing.

The lace trapping device 20 has a lace trapping element comprising a strip of flexible material 25, 25A-25E, and 16A-16D having at least one opening 23, 23A and 23B to admit the lacing 30 through the opening while threading the lacing through eyelets in the footwear 40 to attach the lace trapping element to the footwear, as shown in FIGS. 1 and 2.

In the preferred embodiment of FIGS. 1-7, the lace trapping element is a single strip of flexible material 25 having a central opening 23 to receive the threaded lacing 30 and a mating piece of hook and loop fasteners 21 and 22 at each end of the strip on opposite sides of the strip so that the lacing is threaded into the opening 23 in the middle

of the strip 25, as in FIGS. 1 and 2 and the two ends held open to receive the tied ends 31 of the lacing at a lower end of the lacing and the two ends of the strip 25 held open as in FIGS. 1 and 2 to receive the tied ends 31 of the lacing and then the ends of the strip overlapped over the tied ends 31 of the lacing and the mating hook and loop fasteners 21 5 and 22 are secured together to form a loop around the tied ends 31 of the lacing trapping them therein as in FIG. 3..

In FIGS. 12 and 13, an alternate embodiment of the lace trapping device 20C, which also can be applied to existing footwear, comprises a strip of flexible plastic material 25C having an opening 23A centrally positioned on the strip of flexible material 10 25C to receive the lacing 30 threaded through the opening in a similar fashion to the preferred embodiment of FIGS. 1 and 2. The lace trapping element comprises two tension arms 16A and 16B attached to the flexible material 25C with one tension arm on each side of the opening 23A. The tension arms 16A and 16B are normally positioned apart and are capable of interlocking around each other to trap the tied ends 31 of the 15 lacing between the tension arms as seen in FIG. 13. The tension of the arms trying to return to their original separated positions holds them together. Each of the two tension arms 16A and 16B further comprises an enlarged outer end 17 which contacts an enlarged outer end 17 on the other of the tension arms to help retain the two interlocking tension arms together.

20 In FIGS. 14 and 15 another alternate embodiment of the lace trapping device 20D, which also can be applied to existing footwear, comprises a strip of flexible plastic material 25D having an opening 23A centrally positioned on the strip of flexible material

25D to receive the lacing 30 threaded through the opening in a similar fashion to the preferred embodiment of FIGS. 1 and 2, and the lace trapping element comprises a tension ring segment 16C attached to the material one side of the opening and a smaller tension ring segment 16D on the other side of the opening. The tension ring segments

- 5 each have mating teeth 14A and 14B and the tension ring segments are capable of interlocking the mating teeth 14A and 14B to form a ring around the tied ends 31 of the lacing to trap the tied ends 31 of the lacing therein, as in FIG. 15.

In FIGS. 16 and 17 another alternate embodiment of the lace trapping device 20E, which also can be applied to existing footwear, comprises a strip of flexible plastic material 25E having a series of openings 23B centrally positioned on the strip of flexible material 25E to receive the lacing 30 threaded through the opening in a similar fashion to the preferred embodiment of FIGS. 1 and 2 but with the lacing 30 cross threaded through the holes 23B, wherein the strip of flexible material 25E with the openings has a second sheet of flexible material 25F hinged thereto by a living hinge 12 and the securing means 15 comprises a pronged snap element 13 protruding from the strip of flexible material 25E adjacent to the openings and the second sheet of flexible material 25 F has a mating snap element opening 11 therethrough so that the pronged snap element 13 is capable of snap fitting in the snap element opening 11 to trap the tied ends 31 of the lacing between the two sheets of flexible material as seen in FIG. 17.

- 20 In FIGS. 8 and 9, an alternate embodiment of the lace trapping device 20A to be applied to a new shoe by a manufacturer has a lace trapping element comprising a single strip of flexible material 25A secured by sewing or other means at one end 18 to one side

of the lacing at a lower end of the threaded lacing on the piece of footwear 40. An outer end of the strip of material 25A has a hook side 21 of a mating hook and loop fastener and a strip having the loop side 22 of the mating hook and loop fastener is attached by sewing or other means to an opposite side of the lacing. After placing the tied ends 31 of

5 the lacing over the threaded lacing 30, the strip of flexible material 25A is capable of overlapping the tied ends 31 of the lacing and the hook side 21 on the strip of material 25A is capable of connecting with the mating loop strip 22 of the mating hook and loop fastener to secure the tied ends 31 of the lacing under the strip of material 25A, as in FIG. 9.

10 In FIGS. 10 and 11, an alternate embodiment of the lace trapping device 20B to be applied to a new shoe by a manufacturer has a lace trapping element comprising a single strip of flexible material 25B secured by sewing or other means at one end 18 to one side of the lacing at a lower end of the threaded lacing on the piece of footwear 40. And the device further comprises a loop 19 of flexible material secured to the footwear 15 40 on an opposite side of the threaded lacing. The securing means comprises mating hook and loop fasteners with one mating element 22 of the hook and loop fasteners attached to an outer end of the strip and another element 21 of the mating hook and loop fasteners attached to the end of the strip adjacent to the footwear, so that the strip 20B is capable of looping under the loop 19 and bending back over itself to engage the mating hook and 20 loop fasteners with the tied ends 31 of the lacing under the strip.

In practice, the user would thread the shoelaces 30 through the first eyelets of the shoe, thread the laces 30 through the hole 23 of the device 20 as the shoe 40 is being

laced up, typically in the forward 1/3 of lace 30 area (as shown in FIG. 1-3), and continue to thread the laces 30 through the remaining shoe 40 eyelets. Once the lace trapping device 20 is attached to the shoe 40, the user would tie the laces 30, open the Mating hook and loop fastener 21 and 22 so that the lace trapping device 20 is laying flat on top 5 of the shoe 40 (as shown in FIG. 2). The tied ends 31 of the lacing are then laid on top of the lace trapping device 20. The user would then overlap the ends of the lace trapping device 20 and form a loop that traps the tied ends 31 of the lacing, thereby securing them with the hook 21 and loop 22 fasteners (as shown in FIG. 3).

In practice, the OEM built-in embodiment of the present invention 20C (as shown 10 in FIG. 10 and 11) would be used by threading the strip 25C through a loop 19, located on the opposite side of the laces 30 from the attachment end 18 of the strip 25C. Then, while leaving the device 20C open, the user would tie the laces 30. There would be a patch of loop fasteners 22 attached on the top of the strip 25C, near the attachment end 18. After the user ties a bow, the loops and ends of the laces 31 would then be held 15 together and brought toward the toe of the shoe 40 so that the strip 25C, when pushed down to allow the hook fasteners 21 to engage with the loop fastener 22 patch on the other side would again "trap" the laces ends 31 (as shown in FIG.11).

In practice, the embodiment represented in FIG. 8 and 9 would be used by first 20 tying the lacing. The tied ends 31 of the lacing would then be held together and brought toward the toe of the shoe 40 so that the strip 25A could overlap the tied ends 31 of the lacing and the hook fasteners 21 on the strip 25A would engage the loop fastener 22 patch on the other side (as shown in FIG 9) to trap the tied ends 31 of the lacing.

In practice, the embodiment represented in FIG. 12 and 13 would be used by first tying the lacing. Next, the user would draw the tied ends 31 of the lacing between two tension arms 16A and 16B with enlarged ends 17 that are normally spaced apart (as shown in FIG 12). The two tension arms 16A and 16B cross over each other and overlap 5 with a tension fit (as shown in FIG 13) to retain the tied ends 31 of the lacing.

In practice, the embodiment represented in FIG. 14 and 15 would be used by first tying the lacing. Next, the user would draw the tied ends 31 of the lacing between the tension ring segments 16C and 16D that are normally spaced apart (as shown in FIG. 14). By pressing the holding tabs 15 bringing tension ring segments 16C and 16D together, 10 the interlocking teeth 14A and 14B mutually engage when overlapped to retain the tied ends 31 of the lacing therebetween (as shown in FIG. 15).

In practice, the embodiment represented in FIG. 16 and 17 would be used by first tying the lacing. Next, the user would place the tied ends 31 of the lacing inbetween the two hinged strips of flexible material 25E and 25F. The pronged snap element 13 is snap 15 fit into the snap element opening 11 to trap the tied ends 31 of the lacing between the two sheets of flexible material as seen in FIG. 17.

It is understood that the preceding description is given merely by way of illustration and not in limitation of the invention and that various modifications may be made thereto without departing from the spirit of the invention as claimed.